

CLAIMS

1. A high strength molten zinc plated steel sheet characterized by comprising a steel sheet including, by wt%,

5 C: 0.05 to 0.40%,
Si: 0.2 to 3.0%, and
Mn: 0.1 to 2.5% and
further including at least one or two or more
types of:

10 P: 0.001 to 0.05%,
S: 0.001 to 0.05%,
Al: 0.01% to 2%,
B: 0.0005% to less than 0.01%,
Ti: 0.01% to less than 0.1%,
15 V: 0.01% to less than 0.3%,
Cr: 0.01% to less than 1%,
Nb: 0.01% to less than 0.1%,
Ni: 0.01% to less than 2.0%,
Cu: 0.01% to less than 2.0%,
20 Co: 0.01% to less than 2.0%,
Mo: 0.01% to less than 2.0%,

with the balance comprised of Fe and
unavoidable impurities, having on its surface a Zn
plating layer containing Al in a concentration of 0.01 to
25 1 wt% and the balance of Zn and unavoidable impurities
and containing inside the steel sheet within 2 μ m from
the interface of said steel sheet oxide particles of at
least one type of oxide selected from an Al oxide, Si
oxide, Mn oxide, or complex oxide comprised of at least
30 two of Al, Si, and Mn.

2. A high strength molten zinc plated steel sheet
as set forth in claim 1, characterized in that said oxide
particles are comprised of at least one of silicon oxide,
manganese oxide, aluminum oxide, aluminum silicate,
35 manganese silicate, manganese aluminum oxide, and
manganese aluminum silicate.

3. A high strength molten zinc plated steel sheet

as set forth in claim 1 or 2, characterized in that an average diameter of the particle size of said oxide is 0.001 to 1 μm .

5 4. A process of production of a high strength
molten zinc plated steel sheet comprised of the
ingredients described in claim 1 by a continuous molten
zinc plating system, said process of production of a high
strength molten zinc plated steel sheet characterized by
making a heating temperature T at a recrystallization
10 annealing step in a reducing furnace of said system 650°C
to 900°C, passing the steel sheet through an atmosphere
where a ratio $\text{PH}_2\text{O}/\text{PH}_2$ of the steam partial pressure PH_2O
and hydrogen partial pressure PH_2 of the atmosphere of
said reducing furnace is $1.4 \times 10^{-10} \times T^2 - 1.0 \times 10^{-7} \times T + 5.0 \times 10^{-4} \leq$
15 $\text{PH}_2\text{O}/\text{PH}_2 \leq 6.4 \times 10^{-7} \times T^2 + 1.7 \times 10^{-4} \times T - 0.1$, forming an internal
oxide of claim 1 at a region from the surface of the
steel sheet to a depth of 2.0 μm , then performing molten
zinc plating treatment.

20 5. A process of production of a high strength
molten zinc plated steel sheet as set forth in claim 4,
characterized in that said oxide particles are comprised
of at least one of silicon oxide, manganese oxide,
aluminum oxide, aluminum silicate, manganese silicate,
manganese aluminum oxide, and manganese aluminum
25 silicate.

6. A process of production of a high strength
molten zinc plated steel sheet as set forth in claim 4,
characterized in that an average diameter of the particle
size of said oxide is 0.001 to 1 μm .